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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Priority: PCT/SE99/02291 filed 8 December 1999 that claims priority in Swedish Application No. 9804243-5 filed 8 December 1998

Inventor(s): Michael Holmström

Title: *Device and Method for Spray Extrusion*

Atty. Docket No. 230.008

PRELIMINARY AMENDMENT

Director of the U.S. Patent and Trademark Office
Washington, DC 20231

Dear Sir:

This preliminary amendment is directed to a new U.S. application that is a national phase of PCT/SE99/022291. Please enter the following amendments before calculating any fees:

In The Specification

Please delete the paragraph on page 1, beginning at line 23 to line 31.

After the "SUMMARY OF THE INVENTION," line 34, page 1, please insert the following:

The present invention resolves the above problems by replacing the slot with a row of holes. In this way, the nozzle will have about the same extension as the previous slot, whereas the outlet area of the nozzle will be substantially smaller. Thanks to the smaller area, the pressure inside the nozzle will increase, and a higher discharge velocity of the jet will be achieved. Hereby, the application distance between the object and the nozzle can be increased, whilst the material will still reliably hit the object. The material will fill out any irregularities in the object in a more reliable way. Through the increased pressure, the material will also be distributed more evenly across the entire spread of the nozzle.

Please replace paragraph beginning on page 2, line 3 with the following:

The invention is defined by the appended independent claims, whereas advantageous embodiments are defined in the dependent claims.

In The Claims

Please substitute pending claims 1-8 with the corresponding amended claims as follows:

1. Device for spray extrusion, for connection to a source of coating material under pressure, comprising a nozzle for spraying the material onto an object, characterised in that the nozzle has a discharge aperture in the form of a pattern of holes, debouching into the front surface of the nozzle, said holes being arranged to cause the coating material to be discharged from the nozzle in separate strings from each hole.
2. Device according to claim 1, characterised in that said holes are arranged in a row.

3. Device according to claim 1, characterised in that the discharge aperture has a discharge area equal to about 10 - 20 % of a corresponding uninterrupted discharge aperture.

4. Device according to claim 2, characterised in that said holes are circular.

5. Method for spray extrusion by means of a pressurised source of coating material connected to a nozzle for spraying the material onto an object, characterised in that a raised pressure is created in the nozzle by means of a discharge aperture in the form of a pattern of holes, causing the material to be discharged from the nozzle in separate strings from each hole with a relatively high discharge velocity whereby the material strings will hit the object individually, to subsequently fuse together thereon into a flat, continuous strip of material.

6. Method according to claim 5, characterised in that said holes are arranged in a row.

7. Method according to claim 6, characterised in that the discharge aperture has a discharge area equal to about 10 - 20 % of a corresponding uninterrupted discharge aperture.

8. Method according to claim 7, characterised in that said holes are circular.

Please add the following new claims:

9. A nozzle for discharging a low viscosity coating wherein the nozzle comprises a connector, a body, and a tip with the tip having a plurality of pairs of coating discharge holes arranged in a line with adjacent coating discharge holes spaced apart such that a stream of the coating is discharged from each coating discharge hole that is separate from the stream of the coating that is discharged from every other coating discharge hole.

10. The nozzle according to claim 9 wherein the plurality of pairs of coating discharge holes collectively define a discharge opening having a discharge area that lies within 10% to 20% of a corresponding, uninterrupted discharge opening.

11. A nozzle for discharging a low viscosity coating wherein the nozzle comprises a connector, a body, and a tip with the tip having a plurality of pairs of round coating discharge holes arranged in a line with adjacent coating discharge holes spaced apart such that a stream of the coating is discharged from each coating discharge hole that is separate from the stream of the coating that is discharged from every other coating discharge hole, and wherein the plurality of pairs of coating discharge holes collectively define a discharge aperture having a discharge area that lies within 10% to 20% of a corresponding, uninterrupted discharge aperture.

REMARKS

This amendment is presented to eliminate multiple dependent claims and to correct minor informalities to place the application in better condition for allowance. Claims 9-11 are new and presented to better define applicant's invention. Entry of the above amendments is requested and early consideration and allowance is respectfully requested.

The Examiner is invited to contact the undersigned if it would expedite allowance of this application.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Amended Specification Paragraphs

Paragraph beginning on page 2, line 3:

The invention is defined by the appended independent claims ~~1 and 6~~, whereas advantageous embodiments are defined in the dependent claims.

Amended Claims

Please substitute pending claims 1-8 with the corresponding amended claims as follows:

1. (Amended) Device for spray extrusion, for connection to a source of coating material under pressure, comprising a nozzle for spraying the material onto an object, characterised in that the nozzle has a discharge aperture in the form of a pattern of holes (~~5~~), debouching into the front surface of the nozzle, said holes (~~5~~) being arranged to cause the coating material to be discharged from the nozzle in separate strings from each hole(~~5~~).
2. (Amended) Device according to claim 1, characterised in that said holes (~~5~~) are arranged in a row.
3. (Amended) Device according to claim 1 ~~claims 1 or 2~~, characterised in that the discharge aperture has a discharge area equal to about 10 - 20 % of a corresponding uninterrupted discharge aperture.
4. (Amended) Device according to claim 2 ~~any one of the preceding claims~~, characterised in that said holes (~~5~~) are circular.

5. (Amended) Method for spray extrusion by means of a pressurised source of coating material connected to a nozzle for spraying the material onto an object, characterised in that a raised pressure is created in the nozzle by means of a discharge aperture in the form of a pattern of holes (5), causing the material to be discharged from the nozzle in separate strings from each hole (5) with a relatively high discharge velocity whereby the material strings will hit the object individually, to subsequently fuse together thereon into a flat, continuous strip of material.

6. (Amended) Method according to claim 5 ~~claims 5~~, characterised in that said holes (5) are arranged in a row.

7. (Amended) Method according to claim 6 ~~claims 5 or 6~~, characterised in that the discharge aperture has a discharge area equal to about 10 - 20 % of a corresponding uninterrupted discharge aperture.

8. (Amended) Method according to claim 7 ~~any one of the preceding claims 5 to 7~~, characterised in that said holes (5) are circular.